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QUARTERLY GROUNDWATER MONITORING REPORT
FIRST QUARTER 2006
CORSAIR, LLC PROPERTY
4954 YORK BOULEVARD
HIGHLAND PARK, CALIFORNIA

April 14, 2006

California Regional Water Quality Control Board
Los Angeles Region
CAO No. 2000-02
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TABLE OF CONTENTS

1.0 INTRODUCTION 1
  1.1 BACKGROUND 1
    1.1.1 Geology 1
    1.1.2 Hydrology 1
    1.1.3 Environmental History 2
  1.2 PROJECT OBJECTIVES 5
2.0 GROUNDWATER SAMPLING ACTIVITES 6
  2.1 GROUNDWATER MONITORING WELL INSPECTION AND GAUGING 6
  2.2 GROUNDWATER PURGING AND SAMPLING 6
  2.3 ANALYTICAL PROGRAM 7
  2.4 QUALITY ASSURANCE/QUALITY CONTROL REVIEW 7
  2.5 SAMPLE TRACKING 8
3.0 GROUNDWATER GAUGING RESULTS 9
  3.1 DEPTH TO WATER 9
  3.2 GROUNDWATER GRADIENT 9
4.0 GROUNDWATER MONITORING RESULTS 10
  4.1 DISCUSSION 11
5.0 REFERENCES 12

1.0 INTRODUCTION

This report presents the results of the First Quarter 2006 groundwater monitoring event conducted on March 8, 2006 at the Corsair, LLC York Property (Site). The Site is located at 4954 York Boulevard, in the community of Highland Park, Los Angeles, California (Figure 1). The quarterly monitoring program is required by the Regional Water Quality Control Board, Los Angeles Region (RWQCB).

1.1 Background

The Site was a former gasoline station, and after abandonment and demolition, is currently a vacant lot with a graded soil surface and a chain link fence along the perimeter (Figure 2). A commercial development is proposed for the Site.

1.1.1 Geology

The Site is located in the Highland Park area within the northern portion of the Los Angeles Basin. The Highland Park area is bordered by the San Rafael Hills to the north, the Arroyo Seco (an intermittent stream) and Repetto Hills to the east, the Mt. Washington group of hills to the south, and the Elysian Valley and Elysian Hills to the west. The Site is located at an elevation of approximately 560 feet above mean sea level (msl).

Locally, the Site is underlain by Recent-age alluvium consisting of sand, silt, clay, and gravel. Lithologic descriptions recorded during previous subsurface assessments show that interbedded layers of silty sand, sandy silt, and clay were encountered. A discontinuous clay lens was encountered on the Site in borings MW-20 and MW-22 at a depth of approximately 10 feet below ground surface (bgs). This clay was encountered at a depth of 5-feet bgs in off-site borings MW-27, MW-31, and MW-29. All borings were drilled to a maximum depth of 25 feet except for boring MW-33, which was drilled to 35 feet bgs. Silty sand or sandy silt was encountered in all borings at 25 feet bgs, with sandy silt encountered at 30 and 35 feet bgs in boring MW-33. Note that the wellhead of MW-33 is higher in elevation than the other monitoring wells.

1.1.2 Hydrology

The Site is located within the Eagle Rock Basin, within the southeast corner of the Upper Los Angeles River Area (Los Angeles County Department of Public Works [LACDPW], 1998). The Raymond Fault and northwest-southeast trending faults in the Repetto Hills act as barriers to groundwater flow from the San Fernando Groundwater Basin. Yield of usable water from the Eagle Rock Basin is moderate, and aquifers have not been well delineated in the Site area. The aquifer within the Holocene alluvial deposits is described as poorly sorted, unconsolidated, coalescing alluvial fan deposits of sand, gravel and clay (California Division of Mines and Geology, 1975). According to the LACDPW, Division of Hydrologic Records, monitoring well 3987H is located approximately 1,500 feet west-northwest of the Site. Depth to water in that well, as measured on April 14, 2001, was 5 feet bgs.

The unconfined groundwater flow beneath the Site is controlled by the hydraulic gradient, with influences from the discontinuous clay lens. Historically, depth to water ranges from approximately 5 feet to 10 feet in on-site wells. Depth to water in most of the off-site wells ranges from approximately 8 feet to approximately 22 feet bgs, with increasing depths to the south. The average groundwater elevation in all wells since November 2002 is 543.5 feet msl. Historically, groundwater has shown a general southeast flow direction (although variable on site).

1.1.3 Environmental History

The following bullet summary presents the environmental history. Appendix A includes a figure showing the previous site layout.

- On May 1, 1981, the LAFD received a report of a strong gasoline odor from the storm drain at Avenue 50 and York Boulevard. Shell Oil Company abated the source, and throughout 1982, utilized a dual-phase extraction system to remove free-floating product from the dispenser area at the northeast comer of the Site along Avenue 50. A total of 610 gallons of gasoline were recovered from an estimated release of approximately 800 gallons that resulted from a broken fuel line.

- Sometime between 1985 and 1992, six wells (Wells A-F) were installed, reportedly for a vapor extraction remediation system. Information regarding the operation or use of these wells is not available.

- From March 28 through 30, 1992, Randall Weidner performed a preliminary site assessment at the Site. Twelve borings were drilled to depths of 12 to 21 feet bgs in the underground storage tank (UST) area and near the dispenser islands. Borings B-1 through B-7 were drilled in the southeast part of the property. Borings B-8 through B-12 were drilled along the northeast and northern sides of the Site. Analytical data indicated the presence of hydrocarbons and aromatic volatiles in the shallow soil samples from all borings. The highest concentration of total recoverable petroleum hydrocarbons (TRPH) was detected at a depth of 10 feet bgs in boring B-1 (adjacent to the waste oil tank) at a concentration of 4,600 parts per million (ppm). The highest concentrations of total petroleum hydrocarbons as diesel (TPHd) and total petroleum hydrocarbons as gasoline (TPHg) were measured in the UST pit area, along piping runs, and near the dispenser islands; generally within soils from surface to the upper 7 feet bgs. Volatile organic compounds (VOCs) showed a pattern of distribution similar to that of gasoline and diesel. The highest concentration of benzene, toluene, ethylbenzene and xylenes (BTEX) were measured to be 18, 160, 66, and 380 ppm, respectively. Free-phase product was measured in two wells (Wells A and B) at thicknesses of 0.67 and 1.17 feet, respectively.

- In May 1992, a Diesel Spill Release Notice was submitted to the LAFD for the Site. The notice listed the Site as a P&M Station.

- In December 1996, Soil Pacific collected groundwater samples from Wells A through F and newly discovered well B-4. TRPH and heavy oil were detected in Well A (no other well was analyzed for TRPH). TPHg and BTEX were detected In Wells A, B, and B-4. Fuel oxygenate methyl tert-butyl ether (MtBE) was detected in Wells A, B, and B-4.

- On September 24, 1997, NuTech collected groundwater samples from nine of the 11 groundwater monitoring wells identified in previous reports as on the service station property. Free-phase-product thicknesses were again measured to be 0.67 and 1.17 feet in

Wells A and B, respectively. Additionally, it appeared that waste oil had been poured down Well A; therefore, NuTech did not collect a groundwater sample for analysis from this well.

- In April 1998, NuTech removed free-phase product from on-site wells using hand-bailing methods and a vacuum track. A total of 316 gallons of petroleum hydrocarbon contaminated liquids (estimated to be a 50:50 oil to water mixture) was reportedly recovered from the wells.
- In May 1998, NuTech conducted groundwater sampling at the Site. Wells were examined for free-phase product. Free product was noted only in Well N-V-4. The free-product thickness in Well N-V-4 was not noted in NuTech's report. Groundwater analytical results for this sampling event are summarized in Table 2 of the NuTech report.
- In the summer of 1999, a licensed contractor removed the USTs.
- On August 6, 1999, stockpiled soil originating from the removal of USTs and associated piping was backfilled into the excavations. Perforated piping was placed in the UST and pump island excavations prior to backfilling. The intended use of this piping was for a future soil vapor extraction system.
- On February 7, 2000, Soil Pacific submitted a workplan to the RWQCB entitled Supplemental Work Plan & Phase II Site Assessment (Remedial Investigation) & Well Repair, Former P&M Service Station.
- On March 6, 2000, the RWQCB conditionally approved implementation of Soil Pacific's Supplemental Workplan & Phase II Site Assessment.
- On April 16, 2000, Pacific Edge was retained as a subcontractor by the owner's contractor, Innovative Contractor Solutions (ICS) to implement the conditionally approved workplan.
- On April 17 through April 28, 2000, Pacific Edge conducted Phase II field activities at the Site. Soil sampling work included the drilling and sampling of 12 soil borings. Eight new groundwater monitoring wells (MW-12 through MW-19) and six existing wells (C, D, E, F, N-V-1, and N-V-2) were sampled. The groundwater flow direction was measured to be south-southeast. During this investigation, free product was measured in only one well (N-V-1) at a thickness of 0.6 inches. This investigation indicated that the mass of contaminants in soil and the shallow groundwater were located at and/or near the former USTs and pump islands.
- On May 2, 2000, ICS began free-phase product removal within well N-V-1 by placing an oil adsorbent sock in the well. Since this time, three additional wells (N-V-2, MW-14, and MW-15) have been included in the free product removal activity. Recent free-product recovery monitoring events have shown minimal to no hydrocarbon sheen present on the groundwater in these wells.
- Remedial excavations were conducted in October 2001. An unknown volume of soil was excavated from the former UST and fuel dispenser islands areas, then transported off-site for recycling. The excavation area was backfilled with ¾–inch crushed rock to approximately 5 feet bgs, which was overlain by clean soil backfill.

- Pacific Edge had conducted quarterly groundwater monitoring since April 2000. In general, the groundwater flow direction has been determined to be predominately to the south-southeast. During the April 2000 and the March 2001 monitoring events, the groundwater flow direction was northerly and easterly, which may have been due to accumulation of rainwater in the excavation (backfilled with gravel) following the removal of the USTs. Analytical results indicated that the greatest mass of contaminants in groundwater was located in the areas of the former USTs and pump islands. Analytical results indicated that off-site migration of petroleum compounds has occurred along all boundaries of the property.

- The Source Group, Inc. (SGI) conducted a Phase II Site Assessment of the property in November and December 2002. The purpose of the work was to assess the extent of soil and groundwater contamination and determine the limits of the off-site migration of hydrocarbons in groundwater. The work included drilling and sampling 14 on- and off-site soil borings using a hollow stem auger (HSA) drill rig. The 14 soil borings were converted to groundwater monitoring wells, which were subsequently surveyed, developed, gauged, purged, and sampled. Seventy soil samples were analyzed for gasoline-, diesel-, and oil-range hydrocarbons, for BTEX compounds, and for oxygenates. Concentrations of fuel compounds were detected in soil samples from the boreholes for groundwater monitoring wells MW-20 through MW-26. All seven of those boreholes (monitoring wells) are located on site. The highest levels of such fuel compounds were present in the soil along the east-southeast margin of the Site. This is likely caused by the inaccessibility to affected soil with the 1:1 sloped excavation wall that was necessary to maintain sidewall stability in the remedial excavation. Based on the historical environmental data relative to the results from this investigation, the predominant mass of fuel constituents in soil was removed during the remedial excavation. The remaining fuel hydrocarbons are present in greatest proportion within the smear zone, along the surface of the water table.

- During the November-December 2002 assessment, SGI collected 25 water samples for analysis of gasoline-, diesel-, and oil-range hydrocarbons, BTEX compounds, oxygenates, and bioremediation parameters. Dissolved-phase fuel constituents were detected in 10 (all on-site wells) of the 21 monitoring wells sampled during this phase of assessment. TPHg and TPHd were present at concentrations ranging from non-detectable (<50 micrograms per liter [µg/l]) to 19,400 µg/l (MW-22) and non-detectable (<0.50 milligrams per liter [mg/l]) to 1.5 mg/l (MW-14), respectively. No dissolved-phase total petroleum hydrocarbons as oil (TPHo) was detected in any of the groundwater samples. Benzene was detected only in groundwater monitoring wells MW-14 and MW-15 at concentrations of 94.6 µg/l and 145 µg/l, respectively. Of the fuel oxygenates detected in the groundwater monitoring wells, MtBE was the most prevalent (detected in 10 monitoring wells), ranging in concentration from non-detectable (<2.0 µg/l) to 10,700 µg/l (MW-22). Di-isopropyl ether (DIPE) was detected in six groundwater monitoring wells, ranging from 3.5 µg/l (MW-16) to 198 µg/l (MW-22). All other wells had non-detectable (<2.0 µg/l) levels of DIPE. Ethyl *tertiary*-butyl ether (EtBE), *tertiary*-amyl methyl ether (tAME), and *tertiary*-butanol (tBA) were not detected in any of the 21 groundwater monitoring wells during this monitoring event. Groundwater was encountered during drilling between approximately 5 and 20 feet bgs. Static groundwater levels measured on November 26, 2002 ranged from 5.56 to 22.07 feet below tops of casings. The groundwater flow direction is toward the south-southwest at an average gradient of approximately 0.025 feet per foot (ft/ft). Groundwater analytical results from this investigation have provided adequate plume delineation. The wells showed non-detectable to low concentrations of contaminants of concern in the up-, down-, and cross-gradient directions.

- Two observation wells (OW-1 and OW-2) were installed by SGI on April 16, 2003. The wells were installed for use in feasibility testing (aquifer and vadose zone). Test well OW-1 was installed approximately 5 feet northeast of observation well MW-18 and test well OW-2 was installed approximately 17 feet northeast of well MW-18 (used as the pumping well). The 5- and 15-foot soil samples from both borings were submitted to a California State laboratory for analysis of total petroleum hydrocarbons (TPH) full carbon chain, BTEX, and fuel oxygenates. None of the target chemicals was detected in any of the soil samples. The wells were constructed with 2-inch diameter, schedule 40 PVC, 0.02-inch slots, #2/12 Monterey Sand in the annulus to approximately 1 foot above the well screen. The well screen was placed from 25 feet bgs to 5 feet bgs. The wells were constructed for feasibility testing only and are not part of the groundwater monitoring program.

- In April 2003, SGI conducted feasibility testing at the site, which consisted of two aquifer tests and a soil vapor extraction test. Test 1 used 4-inch-diameter well MW-18 for groundwater extraction, and on-site wells OW-1, OW-2, MW-23, and MW-14 as observation wells to measure pumping influences (drawdown) in the aquifer during testing. Test 2 used 4-inch-diameter well MW-15 for groundwater extraction, and on-site groundwater monitoring wells MW-14, MW-16, MW-20, MW-22, and MW-26 as observation wells. To investigate the viability of SVE for site remediation, the effective radius of influence (ROI; advection and vacuum) for SVE beneath the site. To document flow-versus-vacuum relationships, a soil vapor extraction test (VET) was completed using well MW-14. Results of the feasibility testing were used to determine that soil vapor extraction would be only marginally effective due to the low-permeability soil.

1.2 Project Objectives

Objectives of the First Quarter 2006 monitoring program included:

- Gauge depth to water, and calculate groundwater elevation and gradient of the shallow aquifer;
- Collect samples from the shallow aquifer for analysis of target chemical contaminants;
- Continue to evaluate any trends and indicators of natural attenuation by monitoring biological parameters; and
- Pursue site redevelopment as commercial retail with appropriate safeguards for mitigation of potential subsurface vapor intrusion.

2.0 GROUNDWATER SAMPLING ACTIVITES

Groundwater sampling for the First Quarter 2006 reporting period was conducted March 8, 2006. The following 21 monitoring wells were monitored and sampled:

On-Site Wells	Off-Site Wells
MW-14	MW-12
MW-15	MW-13
MW-16	MW-19
MW-18	MW-27
MW-20	MW-28
MW-21	MW-29
MW-22	MW-30
MW-23	MW-31
MW-24	MW-32
MW-25	MW-33
MW-26	

All on-site and off-site groundwater monitoring wells were gauged and sampled.

2.1 Groundwater Monitoring Well Inspection and Gauging

Groundwater levels in monitoring wells were gauged for depth below the top of the well casing by using a Solinst™ Model 122 Interface Probe. The meter was decontaminated before each measurement by washing with a solution of tap water and non-phosphate detergent and then thoroughly rinsed with deionized water. Based on the results from the previous quarterly monitoring event, the monitoring wells were gauged in expected order of increasing petroleum hydrocarbon concentrations to minimize the potential for cross-contamination. Free product was not encountered in any of the wells. Water level measurements were recorded on a *Groundwater Well Gauging Sheet* included in Appendix B.

2.2 Groundwater Purging and Sampling

During purging, groundwater parameters including temperature, conductivity, dissolved oxygen (DO), pH, oxidation-reduction potential (ORP), and turbidity were monitored in all the monitoring wells using a YSI™ Model 6820 multi-probe. Wells were purged using dedicated 1-inch-diameter polyvinyl chloride (PVC) stinger tubes connected to a vacuum truck. The wells were purged of at least three well volumes of water or until dry. *Groundwater Monitoring Well Field Sampling Forms* and a table summarizing the measured groundwater parameters are included in Appendix C.

Approximately 301 gallons of purge water were removed from the 21 wells by a vacuum truck provided by Nieto & Sons of Brea, California. Based on previously documented groundwater conditions, the purge water was characterized as non-hazardous waste and transported to DeMenno Kerdoon, located in Compton, California for treatment and recycling. The non-hazardous waste data form for delivery of this waste to DeMenno Derdoon is included in Appendix D.

After purging, the wells were allowed to recharge to at least 80% of their static level before groundwater samples were collected. At each well, new disposable bailers and retrieval cord were used for sampling to eliminate the possibility of contamination between wells.

Groundwater samples from each well were placed in analysis-specific containers. The sample containers were labeled with sample-point identification, project name, time and date of collection, and analyses desired. The samples were then placed on ice within an ice chest, and they were managed and transported to the laboratory under standard chain-of-custody protocol.

2.3 Analytical Program

Groundwater samples were delivered to State-certified American Environmental Testing Laboratory, Inc., located in Burbank, California. The laboratory report is included in Appendix E. The list of parameters evaluated during the First Quarter 2006 monitoring event is as follows:

Parameter	Analysis	Analytical Method
TPHg	Total petroleum hydrocarbons as gasoline	EPA Method 8015M
TPHd	Total petroleum hydrocarbons as diesel and oil	EPA Method 8015M
BTEX	benzene, toluene, ethylbenzene, xylenes	EPA Method 8260B
MtBE (Fuel Oxygenate)	Methyl *tertiary*-Butyl Ether	EPA Method 8260B
Other Fuel Oxygenates	DIPE, EtBE, tBA, tAME	EPA Method 8260B
Biological Indicator	Sulfate	EPA Method 300
Biological Indicator	Nitrate	EPA Method 300
Biological Indicator	Ferrous Iron	SM3500-FE-D
Biological Indicator	Methane	RSKSOP-175

2.4 Quality Assurance/Quality Control Review

Field QA/QC samples were collected to document the accuracy and representativeness of the samples. Two duplicate samples identified as MW-50 and MW-60 were obtained from monitoring wells MW-21 and MW-23, respectively, to assure the integrity of the analytical process. The duplicate samples were collected concurrent with the original samples, using the same sampling equipment and procedures. Analytical results show the duplicate samples to be of similar concentrations as the original samples.

Two trip blanks (QCTB-1 and QCTB-2) were collected to ensure that cross-contamination of the water samples did not occur during transport. The samples were prepared by the laboratory using 40-milliliter glass vials containing organics-free water. The trip blank samples were analyzed for TPHg, BTEX compounds, and fuel oxygenates. All results were non-detect for these analytes; therefore, cross-contamination of samples likely did not occur during sample handling.

Laboratory surrogate recoveries as matrix spikes for TPHd, TPHg, BTEX, MtBE, and other fuel oxygenates were within acceptable limits of recovery. Laboratory control samples using analyte standards for nitrate, sulfate, and methane were all within acceptable limits of recovery. Laboratory matrix spikes using analyte standards for TPHd, TPHg, BTEX, MtBE and other oxygenates were within acceptable limits of recovery. Sample 'split' and sample 'split duplicates' for all analytes were within acceptable limits of recovery. See Appendix E for laboratory quality control sample reports.

2.5 Sample Tracking

All groundwater samples were documented on a chain-of-custody record to track the handling of samples from the point of collection to the laboratory. The chain-of-custody record is included in the laboratory report of analytical results (Appendix E). The completed chain-of-custody indicates that all samples were received intact with no substandard conditions noted.

3.0 GROUNDWATER GAUGING RESULTS

3.1 Depth to Water

Groundwater gauging for First Quarter 2006 was performed on the morning of March 8, 2006, using a Solinst™ Model 122 Interface Probe. Depth to water in the on-site wells ranged from 3.70 feet (MW-18) to 6.26 feet (MW-25). Depth to water in the off-site wells ranged from 5.23 feet (MW-19) to 21.57 feet (MW-33). Groundwater levels rose in all 21 wells since Fourth Quarter 2005 (Table 1).

3.2 Groundwater Gradient

On March 8, 2006, depth to groundwater was measured in all 21 wells, as discussed above. Groundwater elevations were calculated relative to wellhead elevations surveyed in November 2002. As with previous quarters, the groundwater gradient for the shallow aquifer is highly variable. The groundwater flow direction underlying the Site for First Quarter 2006 was toward the south to southeast. Including the off-site wells, the groundwater gradient ranged from 0.019 ft/ft to 0.11 ft/ft (Figure 3). The First Quarter 2006 flow direction and gradient are consistent with previous quarters.

4.0 GROUNDWATER MONITORING RESULTS

Table 1 presents the groundwater monitoring and elevation results. Table 2 presents the TPH and BTEX analytical results. Table 3 presents the fuel oxygenate analytical results. Table 4 presents the analytical results for the biological parameters. Tables 5 through 8 provide historic groundwater monitoring and analytical results. Figure 3 illustrates the groundwater gradient for First Quarter 2006. Figures 4, 5, and 6 present the First Quarter 2006 dissolved-phase isoconcentrations for TPHg, benzene, and MtBE, respectively. The following observations and findings are presented:

- Depth to water in the on-site wells ranged from 3.70 feet (MW-18) to 6.26 feet (MW-25).
- Depth to water in the off-site wells ranged from 5.23 feet (MW-19) to 21.57 feet (MW-33).
- Groundwater gradient varies throughout the Site area, and is influenced by the clay layer and remedial excavation (total depth of approximately 18 feet) that was backfilled with ¾-inch gravel. The average groundwater gradient is calculated at approximately 0.025 ft/ft on site and approximately 0.042 ft/ft off site (ranging from 0.019 ft/ft to 0.11 ft/ft project-wide) with variable flow directions (general southeast flow direction in the site vicinity). The flow direction is consistent with previous monitoring events.
- Concentrations of TPHg from on- and off-site wells ranged from non-detect to a maximum of 2,160 µg/l, which was found in well MW-14. Concentrations of TPHd exceeded the practical quantitation limit (PQL) of 0.5 mg/l in only three on-site wells (MW-14, MW-15, and MW-23) at concentrations of 1.41, 4.70, and 2.13 mg/l, respectively. TPHo concentrations remained below the PQL in all wells.
- Benzene concentrations exceeded the PQL in six on-site wells at concentrations ranging from 5.2 µg/l in well MW-18 to 380 µg/l in well MW-15. Benzene was not detected in any off-site wells.
- Toluene, ethylbenzene, and total xylenes concentrations exceeded their PQLs in five on-site wells and none of the off-site wells.
- Concentrations of MtBE ranged from non-detect to 7,410 µg/l, which was found in on-site well MW-22.
- Of the other fuel oxygenates, DIPE and/or tBA, were detected above their PQLs in samples from only on-site wells MW-14, MW-15, MW-20 through MW-23, MW-25, and MW-26. No concentrations of Ethanol, EtBE, and tAME were detected above their PQLs.
- Field readings of DO ranged from 2.28 mg/l (MW-14) to 6.09 mg/l (MW-22). These concentrations may not be representative of actual conditions since the water quality tester values were not stable during a given reading. Field readings of pH ranged from 7.13 (MW-21) to 8.14 (MW-31).
- Ferrous iron and methane were monitored as biological indicators of intrinsic bioremediation. Ferrous iron was detected in two wells at concentrations of 0.73 mg/l (MW-14) and 2.27 (MW-15). Methane was detected in 10 wells at concentrations ranging from 8.1 µg/l (MW-12) to 950 µg/l (MW-20).
- Nitrate and sulfate concentrations were also monitored as indicators of intrinsic bioremediation. Nitrate (as nitrogen) concentrations were detected in all 21 wells at concentrations ranging from 0.150 mg/l (MW-22) to 54.9 mg/l (MW-24). Sulfate was

detected in 20 of the 21 wells at concentrations ranging from 32.5 mg/l (MW-22) to 312 mg/l (MW-27).

4.1 Discussion

A reduction of benzene concentrations was observed in wells MW-14 and MW-15 following the 2001 soil remediation; however, the concentrations have since remained at consistent levels in MW-14 and have increased (from post-remediation levels) in MW-15 (Table 5).

Concentrations of MtBE in MW-26 since Fourth Quarter 2002 ranged from <0.5 µg/l (Third Quarter 2005) to 945 µg/l (Fourth Quarter 2003). These concentrations are lower than abandoned well N-V-2, formerly located in that same area within the former UST pit. For example, during Third Quarter 2001, well N-V-2 had an MtBE concentration of 1,900 µg/l. Additionally, only low levels (less than 2 µg/l) of benzene and toluene have been detected in well MW-26. This compares favorably with BTEX concentrations before the soil remediation from abandoned well N-V-2 (Table 5).

Concentrations of BTEX have never been detected in well MW-21, installed near the former pump islands. This compares favorably with BTEX concentrations before the soil remediation from abandoned well MW-17 (Table 5).

Elevated concentrations of tBA in groundwater collected from MW-15 may be indicative of the natural attenuation of MtBE in the organic-rich soil. This observation is based, in part, by the relative location of MW-22 and the elevation concentration of MtBE in that location.

Concentrations of TPH and BTEX appear to have stabilized over the last 13 quarters. This indicates that the soil remediation conducted in 2001 was successful in that that area no longer exists as a source of groundwater contamination.

Over time, the levels of DO and ORP in groundwater indicate an aerobic environment within the dissolved-phase hydrocarbon plume. As shown on Table 7, elevated methane concentrations in wells MW-14, MW-15, MW-20, and more recently MW-22 indicate methane-utilizing bacteria near the source may be contributing to intrinsic bioremediation.

Reduced nitrogen has been observed in wells MW-14, MW-15, MW-20, MW-22, and MW-23, and reduced sulfate has been observed in MW-14, MW-15, and MW-22. These may indicate denitrification and sulfate reduction. Natural attenuation of TPH, BTEX, and fuel oxygenates may also be occurring through physical processes (advection, dispersion, and sorption).

5.0 REFERENCES

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